This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Currently amended) A microarray comprising spots of a biomolecule-compatible matrix having two or more components of a protein-based system entrapped within the matrix ~~therein~~, wherein the spots are adhered to a surface.

2. (Original) The microarray according to claim 1, wherein the biomolecule-compatible matrix is a sol-gel.

3. (Original) The microarray according to claim 2, wherein the sol-gel is prepared from one or more organic polyol silanes.

4. (Withdrawn) The microarray according to claim 3, wherein the organic polyol silane is derived from one or more of sugar alcohols, sugar acids, saccharides, oligosaccharides and polysaccharides.

5. (Original) The microarray according to claim 3, wherein the organic polyol silane is derived from one or more of allose, altrose, glucose, mannose, gulose, idose, galactose, talose, ribose, arabinose, xylose, lyxose, threose, erythrose, glyceraldehydes, sorbose, fructose, dextrose, levulose, sorbitol, sucrose, maltose, cellobiose, lactose, dextran, (500-50,000 MW), amylose, pectin, glycerol, sorbitol, and trehelose.

6. (Original) The microarray according to claim 5, wherein the organic polyol silane is derived from one or more of glycerol, sorbitol, maltose and dextran.

7. (Original) The microarray according to claim 3, wherein the organic polyol silane is selected from one or more of diglycerylsilane (DGS), monosorbitylsilane (MSS), monomaltosylsilane (MMS), dimaltosylsilane (DMS) and a dextran-based silane (DS).

8. (Original) The microarray according to claim 7, wherein the organic polyol silane is selected from one or more of DGS and MSS.

9. (Original) The microarray according to claim 2, wherein the sol-gel is prepared from one or more of functionalized or non-functionalized alkoxysilanes; functionalized or non-functionalized bis-silanes of the structure $(RO)_3Si\text{-}R'\text{-}Si(OR)_3$, where R may be ethoxy, methoxy or other alkoxy groups and R' is a functional group containing at least one carbon; functionalized or non-functionalized chlorosilanes; silicates; and sugar, polymer, polyol or amino acid substituted silicates.

10. (Original) The microarray according to claim 9, wherein the sol gel is prepared from sodium silicate.

11. (Original) The microarray according to claim 1, wherein the matrix further comprises an effective amount of one or more additives.

12. (Original) The microarray according to claim 11, wherein the one or more additives are selected from one or more of humectants and protein stabilizing agents.

13. (Original) The microarray according to claim 12, wherein the one or more additives are selected from one or more organic polyols, hydrophilic, hydrophobic, neutral or charged organic polymers, block or random co-polymers, polyelectrolytes, sugars and amino acids.

14. (Original) The microarray according to claim 13, wherein the one or more additives are selected from one or more of glycerol, sorbitol, sarcosine and polyethylene glycol.

15. (Original) The microarray according to claim 14, where the additive is glycerol.

16. (Original) The microarray according to claim 1, wherein the surface is a solid support made of glass, plastic, polymers, metals, ceramics, alloys or composites.

17. (Original) The microarray according to claim 16, wherein the surface is a solid support made of glass.

18. (Original) The microarray according to claim 17, wherein the glass is cleaned to substantially remove any organic matter and adsorbed metal ions.

19. (Original) The microarray according to claim 17, wherein the glass is modified with aminopropyltrithoxysilane (APTES), glycidoxyaminopropyltrimethoxysilane (GPS) or another suitable coupling agent that promotes adhesion of the microspots to the planar surface.

20. (Original) The microarray according to claim 19, wherein the glass is modified with glycidoxyaminopropyltrimethoxysilane (GPS).

21. (Original) The microarray according to claim 1, wherein the spots are spatially defined.

22. (Withdrawn, previously amended) A method of preparing a microarray according to claim 1 comprising:

(a) combining two or more components of a protein-based system with one or more biomolecule-compatible precursor solutions; and

(b) applying the combination of (a) to a surface in a microarray format.

23. (Withdrawn) The method according to claim 22, further comprising:

(c) allowing the combination of (a) to gel on the surface.

24. (Withdrawn) The method according to claim 23, wherein the two or more components of a protein-based system and one or more biomolecule-compatible precursor solutions are combined with an effective amount of one or more additives.

25. (Withdrawn, previously amended) A method of performing multi-component assays comprising:

(a) obtaining a biomolecule compatible microarray comprising a matrix having two or more components of a protein-based system entrapped therein according to claim 1;

(b) exposing the biomolecule-compatible microarray to one or more test substances; and

(c) detecting a change in the protein-based system.

26. (Withdrawn) The method according to claim 25, further comprising comparing the change in the protein based system to a control, wherein a change in the protein based system upon exposure to a reagent of interest compared to the control is indicative of the effect of the test substance on the protein based system.

27. (Withdrawn) A kit, biosensor, micromachined device or medical device comprising the microarray according to claim 1.

28. (Withdrawn) A kit comprising one or more microarrays according to claim 1 and optionally, one or more of:

(a) reagents for use with the one or more microarrays;

(b) signal detection array-processing instruments;

(c) databases; and

(d) analysis and database management software;

29. (Withdrawn, previously amended) A method of conducting a target discovery business comprising:

(a) providing one or more assay systems for identifying test substances by their ability to effect one or more protein based systems, said assay systems using one or more microarrays according to claim 1;

(b) (optionally) conducting therapeutic profiling of the test substances identified in step (a) for efficacy and toxicity in animals; and

(c) licensing, to a third party, the rights for further drug development and/or sales or test substances identified in step (a), or analogs thereof.